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APPENDIX J

MECHANICAL PLAN

Submitted as part of the Final Report

for RF Test Console on JPL

Contract No. 950144

NAS 7-100

CONTRIBUTOR:

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DATE:

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WESTINGHOUSE DEFENSE AND SPACE CENTER

SURFACE DIVISION

ADVANCED DEVELOPMENT ENGINEERING

65 125 109-3

MECHANICAL PLAN R-F TEST CONSOLE

The R-F Test Console will be packaged in four 19 inch cabinet racks, located side by side. The proposed arrangement is shown in figure 1.

The cabinets will have welded corners and the seams and openings will be suitably gasketed and shielded to provide maximum r.f.i. attenuation consistent with the state-of-the-art and the limitations imposed by the commercial units forming a part of the assembly. Doors will be provided on the rear for access to the interior and on the front to further aid in the r.f.i. attenuation. A retractable work surface and a utility drawer will be provided in the transmitter cabinet. The work surface will be at desk height. The equipment will be painted in a manner to be defined by the cognizant JPL engineer.

Modular construction will be used in the self-manufactured chassis such as the transmitter and receivers. The packaging concept is illustrated in figures 2 and 3. Each circuit module will be composed of an 8" x 4" aluminum plate on which a Micarta board is mounted. The Micarta board will carry the circuit components and a connector. The component layout will be similar to a printed circuit board, however, point-to-point interconnecting wiring will be used. The aluminum plate will provide an r-f shield for the circuit when the modules are inserted into a rack in a card file arrangement. It is proposed to assemble the boards in a double row arrangement in a slide-out drawer.

TRANSMITTER RACK	RMS VOLTMETER	POWER METER	COMMERCIAL INSTR.	COUNTER	LINEAR S/N SUMMER	BOLOMETER PREAMPLIFIER	RECEIVER RACK	WEINSCHEL ATTENUATOR
	DIGITAL VOLTMETER			OSCILLOSCOPE		DIFFERENTIAL NULL DETECTOR		PHASE SHIFTERS
	PHASE NOISE INSTRUMENTATION					POWER SAMPLER		F M RECEIVER
	SPECIAL TEST INSTRUMENTATION			SPECTRUM ANALYZER DISPLAY		ATTENUATION CALIBRATOR		P M RECEIVER
	FREQUENCY SYNTHESIZER					LEVEL CONTROL		P M RECEIVER
	FM/PM TRANSMITTER			SPECTRUM ANALYZER		PRECISION STEPATTENUATOR		PHASE DETECTOR
	RETRACTABLE WORK SURFACE			FUNCTION GENERATOR		PRECISION STEPATTENUATOR		PHASE DETECTOR
	UTILITY DRAWER			OSCILLATOR		NOISE GENERATOR		POWER DISTRIBUTION PANEL
	POWER DISTRIBUTION PANEL & POWER SUPPLIES			BLANK PANEL		NOISE AMPLIFIER		POWER SUPPLY
	BLOWER			BLOWER				POWER SUPPLY
								POWER SUPPLIES
								BLANK PANEL

R-F TEST CONSOLE

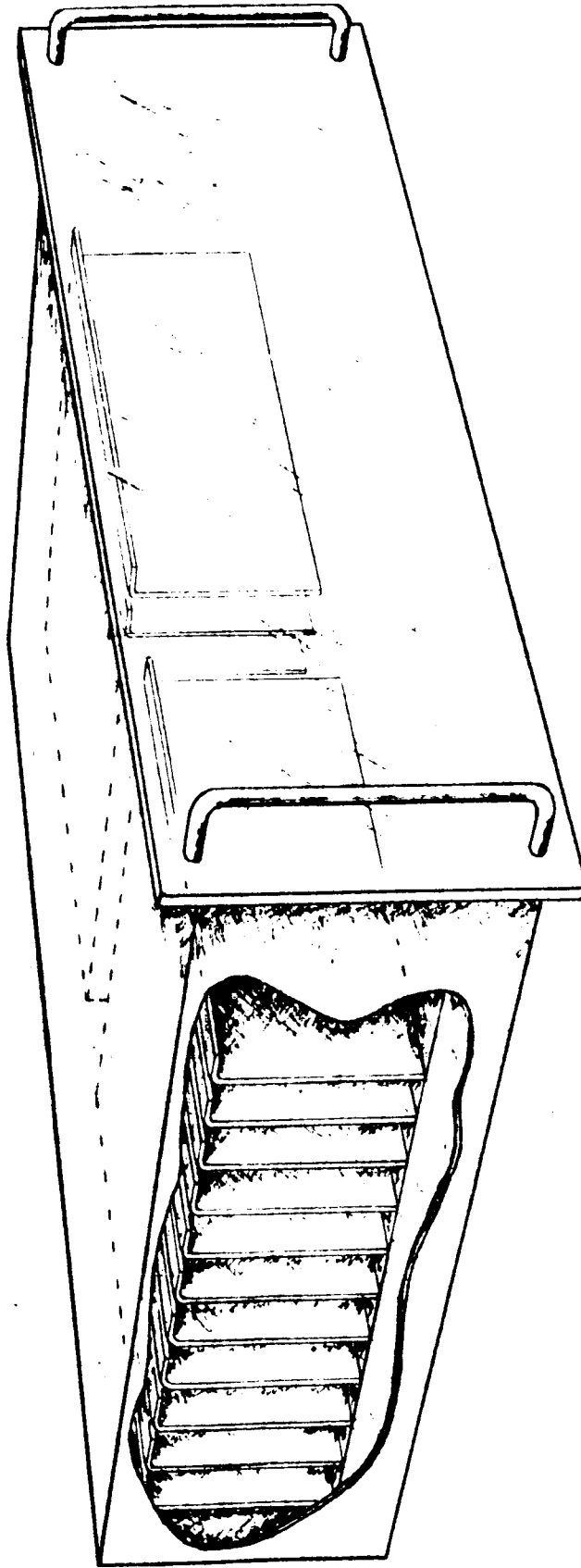
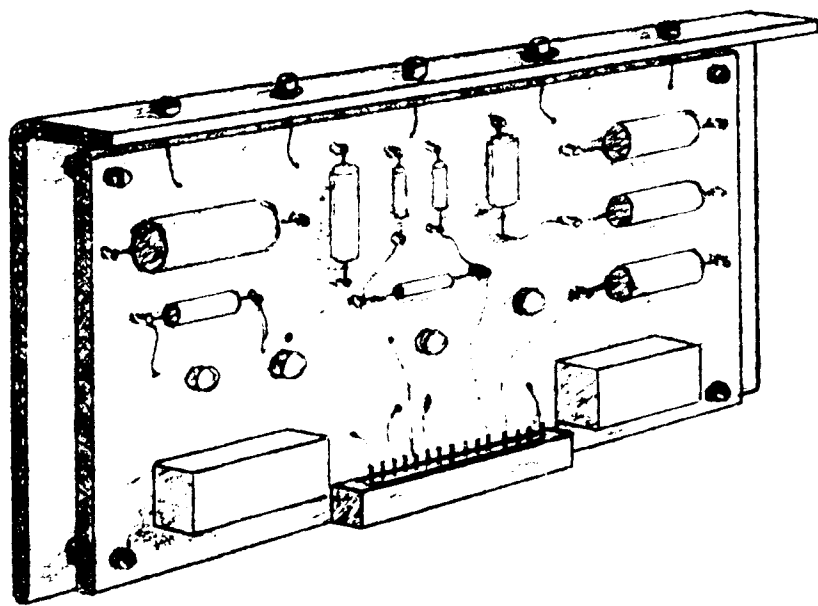


FIGURE 2

3

4.00 INCHES



8.00 INCHES

FIGURE 3

Each board will be plugged-into the drawer the same as a printed circuit board. Each plate will have a flange at the top, containing the test points and coaxial connectors.

The following list identifies the modularized chassis and indicates the quantity of modules. In addition to the modules, other required components and sub-assemblies (such as a phase detector in the receivers) will be mounted within the chassis.

1. Synthesizer	21 modules
2. Phase Noise Instrumentation	5 "
3. FM/PM Transmitter	10 "
4. PM Receiver	36 "
5. FM Receiver	13 "

A gasketed cover plate will be used on both the top and the bottom of each drawer to provide r.f.i. sealing. External coaxial connectors and controls will be brought out to the front panel of the drawer. All other external wiring will terminate in a connector at the rear of the drawer, which will mate with a connector of the cabinet wiring. A cable retractor will be used with each drawer to prevent tangling or kinking the cable when opening or closing the drawer.

A vertical cable trough, such as "Panduit" or "Panel Channel" will be provided in each cabinet to carry the intra-cabinet wiring. Inter-cabinet and external wiring will be carried in conduit at the top of the cabinets.

Cooling air will be provided by blowers located at the bottom of the cabinets. The air intake will be at the bottom of the front

panels and the air discharge will be through a perforated or louvered panel in the top of the cabinets. Filters will be provided at the air intakes to clean the air and both air inlets and air outlets will be r.f.i. shielded.

The chassis, in general, will be arranged so that the transmitter will be contained in one cabinet, the receivers in a second cabinet, the Linear S/N Summer in a third cabinet and the commercial instrumentation in a fourth cabinet. The equipment arrangement will be based upon three factors: the electrical inter-relationship of the various units, the operating inter-relationship of the units, and the location of the controls and displays with respect to human factors considerations. These factors will be studied throughout the design stage in cooperation with the Westinghouse Human Factors Engineering group, to assure the provision of the best overall arrangement.